IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants	:	Glen H. Handlogten et al.
Serial No.	:	10/676,153
Filed	:	September 30, 2003
For	:	HIERARCHICAL SCHEDULING
Examiner	:	Henry Baron
Group Art Unit	:	2462
Confirmation No.	:	6418

Mail Stop Appeal Brief-Patents
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APPELLANT'S BRIEF

Dear Sir:

Appellants hereby appeal to the Board of Patent Appeals and Interferences from the decision of the Examiner in the Final Office Action dated March 11, 2010.

REAL PARTY IN INTEREST

The present application is assigned to International Business Machines Corporation, New Orchard Road, Armonk, New York 10504.

RELATED APPEALS AND INTERFERENCES

A potentially related appeal is currently pending before the Board of Patent Appeals and Interferences in U.S. Patent Application No. 10/675,677. Specifically, Appeal No. 2009-011294 is currently awaiting a decision by the Board of Patent Appeals and Interferences.

STATUS OF THE CLAIMS

Claims 1 and 3-6 have been rejected and are on appeal. Claims 2 and 11 were previously canceled. Claims 7-10 and 12-21 have been allowed.

STATUS OF AMENDMENTS

No amendments have been filed subsequent to the Final Office Action mailed March 11, 2010.

SUMMARY OF CLAIMED SUBJECT MATTER

CLAIM 1

Independent claim 1 is directed to a method of hierarchical scheduling. The method comprises receiving, by a network processor, data from one or more pipes, each pipe including a plurality of pipe flows (as discussed in the specification, for example, on page 13, lines 22-24, and on page 16, lines 26-31). The method further comprises selecting, by the network processor, a winning pipe from the one or more pipes from which to transmit data based upon one or more quality of service parameters corresponding to the winning pipe (as discussed in the specification, for example, on page 14, lines 7-12, pages 18-19, lines 28-3, and page 17, lines 18-28). The method further comprises selecting, by the network processor, a winning pipe flow from the plurality of pipe flows included in the winning pipe based upon one or more quality of service parameters corresponding to the winning pipe flow (as discussed in the specification, for example, on page 14, lines 22-30, page 19, lines 6-11, and page 17, lines 1-17). The method further comprises transmitting, by the network processor, data from the winning pipe flow using a bandwidth corresponding to the winning pipe flow (as discussed in the specification, for example, on page 15, lines 14-17, and page 21, lines 12-18).

"MEANS" OR "STEP"

None of the claims contain an element expressed as a "means for" or "step for" performing a specified function without the recital of structure, material, or acts in support thereof.

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1 and 3-6 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Application No. 2004/0081167 by Hassan-Ali et al. [hereinafter *Hassan-Ali*] in view of U.S. Patent No. 7,020,161 to Eberle et al. [hereinafter *Eberle*].

ARGUMENT

REVIEW OF THE CITED ART

Hassan-Ali

Hassan-Ali is "directed to a hierarchical scheduler architecture". *Hassan-Ali*, paragraph 3. The architecture is for use with an access node terminal in an access network portion of a network. *Id.* The specific citation to *Hassan-Ali* discloses a four-layer hierarchical scheduling functionality to select a number of winner nominees for different service priority categories. *Hassan-Ali*, paragraph 71. The four-layer hierarchical scheduling functionality is then followed by a two-dimensional arbitration mechanism that selects an overall winner among the winner nominees. *Hassan-Ali*, paragraph 72.

Eberle

Eberle is directed "to electronic systems and more particularly to scheduling and allocation of resources within such a system." *Eberle*, col. 1, lines 29-31. *Eberle* discloses "a method for allocating a plurality of resources in a

communication network" that includes two arbitration phases. *Eberle*, col. 2, lines 43-52. The specific citation to *Eberle* expressly states that *Eberle* relies on a pre-calculated schedule. *Eberle*, col. 5, line 22.

A PRIMA FACIE CASE OF OBVIOUSNESS OF CLAIMS 1 AND 3-6 HAS NOT BEEN ESTABLISHED AS NEITHER *HASSAN-ALI* NOR *EBERLE* HAVE BEEN SHOWN TO DISCLOSE "TRANSMITTING, BY THE NETWORK PROCESSOR, DATA FROM THE WINNING PIPE FLOW USING A BANDWIDTH CORRESPONDING TO THE WINNING PIPE FLOW"

Appellants respectfully submit that the record fails to establish that the proposed combination of *Hassan-Ali* and *Eberle* disclose each and every feature of independent claim 1. Accordingly, Appellants respectfully submit that the record fails to establish a prima facie case of obviousness.

"The key to supporting any rejection under 35 U.S.C. 103 is the clear articulation of the reason(s) why the claimed invention would have been obvious." *Manual of Patent Examination Procedure* [hereinafter "*MPEP*"] § 2142 (8th Ed. 2001) (Rev. 8, July 2010). "The Supreme Court in KSR International Co. v. Teleflex Inc., 550 U.S. ___, ___, 82 USPQ2d 1385, 1396 (2007) noted that the analysis supporting a rejection under 35 U.S.C. 103 should be made explicit." *Id.* "The Federal Circuit has stated that 'rejections on obviousness cannot be sustained with mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.'" *Id.* (citing *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006) and *KSR*, 550 U.S. at ___ , 82 USPQ2d at 1396).

In supporting a rejection, "[t]he examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness." *Id.* "If the examiner does not produce a prima facie case, the applicant is under no obligation to submit evidence of nonobviousness." *Id.* (emphasis added). Finally, "[w]hen determining whether a claim is obvious, an examiner must make "a searching comparison of the claimed invention – *including all its limitations* – with the teaching of the prior art." *In re Wada and Murphy*, Appeal 2007-3733 (BPAI 2008)(citing *In re Ochiai*, 71 F.3d 1565, 1572 (Fed. Cir. 1995)). "Thus, 'obviousness requires a suggestion of all limitations in a claim.'" *Id* (citing *CFMT, Inc. v. Yieldup Intern. Corp.*, 349 F.3d 1333, 1342 (Fed. Cir. 2003)(citing *In re Royka*, 490 F.2d 981, 985 (CCPA 1974))(emphasis added).

Independent claim 1 recites, inter alia:

> transmitting, by the network processor, data from the winning pipe flow using a bandwidth corresponding to the winning pipe flow.

Appellants respectfully submit that neither *Hassan-Ali* nor *Eberle* have been shown to disclose at least the above feature. Accordingly, without conceding its propriety, the proposed combination of *Hassan-Ali* and *Eberle* is likewise deficient, even in view of the knowledge of one of ordinary skill in the art.

As an initial matter, Appellants respectfully submit that the Office has failed to meet its burden in establishing a prima facie case of obviousness in that it has not properly designated which part of the references -- or even which reference -- the Office is relying on in forming its rejection. Specifically, the most-recent Office Action states at item 8 that:

> Hassan-Ali teaches… transmitting data from the selected pipe flow using a bandwidth corresponding to the winning pipe flow.

However, at item 9, the Office Action states:

> Hassan-Ali does not teach of transmitting data from the selected pipe flow using a bandwidth corresponding to the pipe flow.

At item 5, the Office Action states:

> Examiner replies that Hassan-Ali teaches of a L2 data structure accordingly that contains "winner FID/TS" i.e. that is a process that involves competition, selection, comparison, or the like.

In view of the above and the prosecution history of the application, it is respectfully submitted that it is not at all clear which reference the Examiner is relying on for disclosing the above feature. For this initial reason, it is respectfully submitted that a prima facie case of obviousness has not been established. Appellants again respectfully note the MPEP's instruction that the Appellants are under no obligation to submit evidence of non-obviousness until a prima facie case is established by the Examiner. Accordingly, favorable review and reversal of the rejection under 35 U.S.C. § 103 are respectfully requested.

Moreover, it is respectfully submitted that neither *Hassan-Ali* nor *Eberle* - either alone or in combination - disclose the above feature. This is solely in the interest of expediting prosecution and in no way concedes that a proper prima facie case has in fact been established. Stated differently, it is

respectfully submitted that the arguments herein should not be treated as a concession that the burden has shifted from the Office to the Appellants. Quite to the contrary and as set forth above, it is again respectfully submitted that the Office has not established a prima facie case of obviousness and that the burden has not shifted from the Office to the Appellants to show non-obviousness.

Turning to the first cited reference, *Hassan-Ali* discloses a hierarchical scheduler architecture. *Hassan-Ali*, paragraph 3. The architecture is for use with an access node terminal in an access network portion of a network. *Id.*

More particularly, *Hassan-Ali* discloses a four-layer hierarchical scheduling functionality. *Hassan-Ali*, paragraph 71. "[W]hen a cell of new flow is received by the fabric, this data flow is presented by one entry in the scheduler" in an "applicable L1 data structure." *Id.* From multiple flows, "only one with the minimum TS is selected by the L1 arbiter, which is then forwarded to the next layer's arbitration, i.e., L2 arbitration." *Id.* "The L2 data structure accordingly contains 'winner FIP/TS' data from different subports. Again, only one entry having the minimum TS is selected to be forwarded to Layer 3." *Id.* The same process occurs for Layers 3 and 4 of the four layer scheduling functionality. *Id.* This results in winner nominees for each service priority category (1218-1 through 1218-6). Thereafter, a two-dimensional arbitration mechanism 1220 is used to select an overall winner among the six nominees. *Hassan-Ali*, paragraph 72.

The specific citation to *Hassan-Ali* that the Office Action relies upon for disclosing the above feature states: "[T]he arbitration block 1220 is provided as a CoS-aware, TS based

Priority Round Robin (PRR)mechanism that is operable to select a winner FID 1222 based on service category as well as the time stamp data. Thus the arbiter 1220 not only determines whether a cell with higher service priority is ready to be serviced in the current time slot, but it also attempts to send a cell having the lowest time stamp as compared to a global time variable." *Id.* In other words, out of six nominees, the arbitration mechanism 1220 selects a winner based on (1) service priority and (2) a time stamp value.

In contrast, claim 1 expressly recites transmitting, by the network processor, data from the winning pipe flow using a bandwidth corresponding to the winning pipe flow." It is respectfully submitted that the record does not establish how choosing a winning FID/TS based on service priority and time stamp value corresponds to transmitting, by a network processor, data from a winning pipe flow using a bandwidth corresponding to the winning pipe flow.

In view of the above, it is respectfully submitted that *Hassan-Ali* cannot properly be relied upon for teaching the above feature.

Turning to the secondary citation, *Eberle* discloses scheduling resources in an electronic system. *Eberle*, col. 1, lines 29-31. More specifically, *Eberle* discloses a system that relies on a pre-calculated schedule. *Eberle*, col. 5, line 22. In *Eberle*, a source node sends a request to a scheduler to periodically reserve a switch slot so that there is sufficient bandwidth for an isochronous data stream that will later be sent. *Eberle*, col. 5, lines 25-34. *Eberle* does not disclose that this process involves any competition, selection, comparison, or the like, that amounts to the isochronous data

stream being a winning data stream. *Eberle* simply discloses that a request is received and a resource reservation is entered. In fact, *Eberle* discloses that the resource reservation scheduling is done "far in advance," thereby avoiding a congested environment that is detrimental to isochronous data. *Eberle*, col. 2, lines 16-26, and col. 5, lines 40-41.

In contrast, claim 1 expressly recites a winning pipe flow that is selected from a plurality of pipe flows based upon one or more quality of service parameters corresponding to the winning pipe flow. As a result, the isochronous data stream of Eberle is not comparable to the winning pipe flow of claim 1, and Eberle fails to disclose or suggest "transmitting, from the network processor, data from the winning pipe flow using a bandwidth corresponding to the winning pipe flow."

In view of the above, it is respectfully submitted that *Eberle* cannot properly be relied upon for teaching the above feature.

As neither *Hassan-Ali* nor *Eberle* – either alone or in combination – disclose the above feature, it is respectfully submitted that a prima facie case of obviousness has not been established. Favorable review and reversal of the rejection under 35 U.S.C. § 103 are respectfully requested.

Appellants also respectfully submit that the Final Office Action has provided no reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way Appellants' independent claim 1 does. The United States Supreme Court has indicated that it is "important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way

the claimed new invention does." *MPEP* § 2143 (citing *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398, 418, 82 USPQ2d 1385, 1395-97 (2007)). Simply stating a benefit of such a combination does not provide any insight, reasoning, or logic that could be properly called "a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements" and is mere hindsight reconstruction. While inventions in most, if not all, instances rely upon building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what, in some sense, is already known, simply finding claim limitations piecemeal in the prior art references and stating a benefit of Appellants' combination does not provide the reasoning required to maintain a prima facie case of obviousness.

The Final Office Action merely states that it would have been obvious to combine the references "[u]sing a bandwidth more th[a]n that corresponding to the winning pipe flow would waste bandwidth resources while using a bandwidth corresponding [to] less th[a]n the winning pipe flow would be inefficient." *Final Office Action*, page 4. While Appellants agree that this may be a benefit of the present invention, *Hassan-Ali* and *Eberle* - and the Final Office Action – fail to provide a reason that one of skill in the art would be motivated to make such a combination.

Further, those skilled in the art would not attempt to combine the references to arrive at the claimed invention. *Eberle* addresses isochronous data streams, which are well known in the art to carry time-sensitive data *Eberle*, col. 2, lines 16-26. Subjecting such data streams to scenarios where they are selected from amongst competing data streams would be adverse to

their time-sensitive nature and is one reason why *Eberle* offers a pre-calculating scheduler. *Eberle*, col. 2, lines 36-39. One skilled in the art would not attempt to combine *Hassan-Ali* and *Eberle* to arrive at the claimed invention because doing so would jeopardize the time-sensitive nature of isochronous data streams and frustrate the stated objectives of *Eberle*.

In view of this additional reason, Appellants respectfully submit that the Final Office Action has provided no reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way Appellants independent claim 1 does. Accordingly, favorable review and reversal of the rejection under 35 U.S.C. § 103 are respectfully requested.

CONCLUSION

Appellants do not believe any other fees are due regarding this Brief. However, if any additional fees are required, please charge deposit account no. 04-1696.

Respectfully submitted,

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Dated: August 11, 2010
Hawthorne, New York

CLAIM APPENDIX

The following claims are under appeal:

Claim 1 (Previously Presented): A method of hierarchical scheduling comprising:

receiving, by a network processor, data from one or more pipes, each pipe including a plurality of pipe flows;

selecting, by the network processor, a winning pipe from the one or more pipes from which to transmit data based upon one or more quality of service parameters corresponding to the winning pipe;

selecting, by the network processor, a winning pipe flow from the plurality of pipe flows included in the winning pipe based upon one or more quality of service parameters corresponding to the winning pipe flow; and

transmitting, by the network processor, data from the winning pipe flow using a bandwidth corresponding to the winning pipe flow.

Claim 3 (Original) The method of claim 1 wherein selecting a winning pipe from the one or more pipes from which to transmit data based upon one or more quality of service parameters corresponding to the winning pipe includes writing data identifying a pipe to a memory address in a group of memory addresses based upon one or more quality of service parameters corresponding to the pipe and scanning the group of memory addresses to find data identifying a pipe.

Claim 4 (Original) The method of claim 3 further comprising rewriting data identifying the winning pipe to a memory address in a group of memory addresses based upon one or more quality of service parameters corresponding to the winning pipe.

Claim 5 (Previously Presented) The method of claim 1 wherein selecting a winning pipe flow from the plurality of pipe flows included in the winning pipe, based upon one or more quality of service parameters corresponding to the winning pipe flow, includes:

writing data identifying a pipe flow to a memory address in a group of memory addresses based upon one or more quality of service parameters corresponding to the pipe flow;

scanning the group of memory addresses to find data identifying a pipe flow;

writing the identified pipe flow in a queue corresponding to the winning pipe based upon one or more quality of service parameters corresponding to the winning pipe flow; and

selecting the identified pipe flow from the queue corresponding to the winning pipe.

Claim 6 (Previously Presented) The method of claim 5 further comprising writing data identifying the winning pipe flow to a memory address in a group of memory addresses, based upon one or more quality of service parameters corresponding to the winning pipe flow.

Evidence Appendix

Not applicable

Related Proceedings Appendix

Not applicable